

## CLAIMS

1. A fuel vaporizing device which supplies fuel vapor containing hydrocarbon to a fuel reformer (2) which produces reformat gas having hydrogen as a main component from the fuel vapor by means of a catalytic reaction, comprising:
  - a fuel vaporizer (6);
  - a fuel injector (8, 9) which supplies fuel into the fuel vaporizer (6);
  - an air injector (8a) which supplies air into the fuel vaporizer (6) to produce an air-fuel mixture in the fuel vaporizer (6), an air supply amount of the air injector (8a) being controlled in relation to a fuel supply amount of the fuel injector (8, 9) so as to obtain an excess air factor of the air-fuel mixture corresponding to a predetermined rich air-fuel ratio; and
  - a glow plug (13) which partially oxidizes the air-fuel mixture produced inside the fuel vaporizer (6).
2. The fuel vaporizing device as defined in Claim 1, wherein the excess air factor corresponding to the predetermined rich air-fuel ratio is within a range of 0.2 to 0.4.
3. The fuel vaporizing device as defined in Claim 1, wherein the fuel vaporizing device further comprises a water injector (11) which supplies moisture to the air-fuel mixture in the fuel vaporizer (6).
4. The fuel vaporizing device as defined in Claim 1, wherein the fuel vaporizing

device further comprises a member (21) which suppresses flame propagation accompanying the partial oxidation of the fuel inside the fuel vaporizer (6).

5. The fuel vaporizing device as defined in any one of Claim 1 through Claim 4, wherein the fuel vaporizing device further comprises a valve (18) which supplies secondary air to the fuel vapor produced by the fuel vaporizer (6).
6. The fuel vaporizing device as defined in Claim 5, wherein the fuel vaporizing device further comprises a heater (14) which heats the secondary air.
7. The fuel vaporizing device as defined in Claim 5, wherein the fuel vaporizing device further comprises a controller (19) programmed to control the valve (18) to stop supplying the secondary air when a start-up period of the reformer (2) is complete.
8. The fuel vaporizing device as defined in Claim 7, wherein the fuel vaporizing device further comprises a sensor (20) which detects a temperature of a catalyst of the fuel reformer (2), and the controller (19) is further programmed to determine that the start-up period of the fuel reformer (2) is complete when the temperature of the catalyst exceeds a predetermined warm-up completion temperature (S2).
9. The fuel vaporizing device as defined in Claim 8, wherein the controller (19) is further programmed to control a secondary air flow rate of the valve (18)

such that the excess air factor of the fuel vapor that is supplied to the fuel reformer (2) during the start-up period of the fuel reformer (2) decreases as the temperature of the catalyst rises (S4, S5).

10. The fuel vaporizing device as defined in Claim 9, wherein the excess air factor of the fuel vapor that is supplied to the fuel reformer (2) during the start-up period of the fuel reformer (2) is set to a value within a range of 3 to 6.

11. The fuel vaporizing device as defined in Claim 8, wherein the controller (19) is further programmed to control the fuel injector (8, 9) such that a fuel injection amount of the fuel injector (8, 9) increases as the temperature of the catalyst rises (S3).